SUBCHAPTER 3. PRELIMINARY ASSESSMENT AND SITE INVESTIGATION

7:26E-3.1 Preliminary assessments

(a) The purpose of a preliminary assessment is to identify the presence of any potentially contaminated areas of concern. If any potentially contaminated areas of concern are identified, then there is a need for a site investigation pursuant to N.J.A.C. 7:26E-3.3. If no potentially contaminated areas of concern are identified, then no further remediation is required at the site.

(b) A preliminary assessment is the first step in the process to determine whether or not a site is contaminated.

(c) A preliminary assessment shall be based on diligent inquiry and include an evaluation of the following:

1. Historical information concerning the site history shall be part of the preliminary assessment unless the remediation is directed at either a specific discharge event (rather than a particular area of concern) or any underground tank or underground tank system. The site history shall include an evaluation of the following to the extent available from diligent inquiry:

i. Site history information from sources including, but not limited to, the following:

(1) Sanborn Fire Insurance Maps;

(2) MacRae's Industrial Directory;

(3) Title and Deed;

(4) Site plans and facility as-built drawings;

(5) Federal, State, county and local government files; and

(6) The Department Geographic Information System;

ii. The site history from the time the site was naturally vegetated, including without limitation:

(1) Names of all owners and operators;

(2) Dates of ownership of each owner;

(3) Dates of operation of each operator; and

(4) Brief descriptions of the past industrial/commercial usage of the site by each owner and operator;

iii. All raw materials, finished products, formulations and hazardous substances, hazardous wastes, and pollutants which are or were present on the site, including intermediates and by-products;

iv. Present and past production processes, including dates, and their respective water use and shall be identified and evaluated, including ultimate and potential discharge and disposal points and how and where materials are or were received onsite (for example, rail, truck);

v. All former and current containers, container or bulk storage areas, above and below ground tanks, above and below ground waste and product delivery lines, surface impoundments, landfills, septic systems and other structures, vessels, conveyances or units that contain or previously contained hazardous substances, hazardous waste, and pollutants, including:

(1) Type;

(2) Age;

(3) Dimension of each container;

(4) Location;

(5) Chemical content;

(6) Integrity (for example, tank test reports);

(7) Volume;

(8) Construction materials; and

(9) Inventory control records unless a Department-approved leak detection system pursuant to N.J.A.C. 7:1E or 7:14B has always been in place and there is no discharge history;

vi. If the site area exceeds two acres, an interpretation of the aerial photographical history of the site, based on available current and historical color, black and white and infrared aerial photographs (scale 1:18,000 or less) of the site and surrounding area at a frequency which provides the evaluator with a historical perspective of site activities. The photographic history shall date back to 1932 or to the earliest photograph available. Aerial photographic coverage is available for review at the New Jersey Department of Environmental Protection

and Energy, Tidelands Management Program, Aerial Photo Library, 9 Ewing Street, Trenton, New Jersey;

vii. Any data or information concerning known discharges that have occurred on the site;

viii. Remediation activities previously conducted or currently underway at the site including dates of previous discharges, remedial actions, and all existing sampling data concerning contaminants at the site. If a government agency was involved, the name of the lead government agency, case identification number, and current case status;

ix. All remedies previously approved by the Department in a remedial action workplan or equivalent document to determine if the remedy remains protective of public health, safety and the environment;

x. All existing environmental sampling data concerning contaminants at the site;

xi. Any known changes in site conditions or new information developed since completion of previous sampling or remediation;

xii. All Federal, State and local environmental permits including permits for all previous and current owners or operators, applied for or received, or both, for the site including:

(1) The name and address of permitting agency;

(2) The reason for the permit;

(3) The permit identification number;

(4) The application date;

(5) The date of approval, denial, or status of application;

(6) The name and current address of all permittees;

(7) The reason for denial, revocation or suspension if applicable; and

(8) The permit expiration date;

xiii. All administrative, civil and criminal enforcement actions for alleged violations of environmental laws concerning the site, including:

(1) The name and address of agency that initiated the enforcement action;

(2) Date of the enforcement action;

(3) The section of statute, rule or permit allegedly violated;

(4) The type of enforcement action;

(5) A description of alleged violations;

(6) The resolution or status of violation and enforcement action; and

(7) A description of any potential environmental impact which may have resulted from the alleged violation; and

xiv. All areas where non-indigenous fill materials were used to replace soil or raise the topographic elevation of the site, including the dates of emplacement.

2. The person conducting the preliminary assessment shall conduct a site visit to verify the findings in (c)1 above.

7:26E-3.2 Preliminary assessment report

(a) The person responsible for conducting the remediation shall prepare a preliminary assessment report which:

1. Presents and discusses all of the information identified, evaluated or collected pursuant to N.J.A.C. 7:26E-3.1;

2. Is presented in a format that corresponds to the outline of N.J.A.C. 7:26E-3.1(c);

3. Shall also include:

i. Scaled site plans detailing lot and block numbers, property and leasehold boundaries, construction or destruction of buildings, areas where fill or cover material has been brought onsite, paved and unpaved areas, vegetated and unvegetated areas, all areas of concern and active and inactive wells; and

ii. Scaled historical site plans and facility as-built construction drawings, if available;

iii. A copy of the United States Geologic Survey (USGS) 7.5 minute topographic quadrangle that includes the site and an area of at least a one mile radius around the site. This map shall be the most recent USGS revision and

shall clearly note the facility location and property boundaries. When a portion of the USGS quadrangle is used, the scale (including a bar scale), north arrow, contour interval, longitude and latitude, along with the name and date of the USGS quadrangle shall be noted on the map; and

iv. A summary of the data and information evaluated pursuant to N.J.A.C. 7:26E-3.1(c)1vii, viii, ix, and x shall be presented by area of concern and all phases of work for a particular area of concern shall be integrated into a single discussion of that area;

4. For each area of concern identified at the site, which has not been remediated under Department oversight, the report shall contain a recommendation that either:

i. The area of concern is potentially contaminated, and thus additional investigation or remediation is required; or

ii. The area of concern is not believed to contain contaminants above the applicable remediation standards, in which case the preliminary assessment report shall include documentation for this belief; and

5. For each area of concern identified at the site, for which a No Further Action Letter was issued, the person responsible for conducting the remediation shall compare the contaminant concentrations remaining in the area of concern or the site with the Department's applicable remediation standards at the time of comparison, and the report shall contain a recommendation that either:

i. The area of concern contains contaminants above the numerical remediation standard applicable at the time of comparison, however, no further remediation is required because:

(1) The contaminant concentrations remaining in the area of concern or the site are less than an order of magnitude greater than the numerical remediation standard applicable at the time of comparison;

(2) The area of concern or the site was remediated using engineering and institutional controls approved by the Department and these controls are still protective of public health, safety and the environment; or

(3) The area of concern or the site were remediated to an approved site specific remediation standard and all of the factors and assumptions which are the basis for deriving the site specific remediation standard remain valid for the site;

ii. The area of concern or site contains contaminants above the numerical remediation standards applicable at the time of comparison and further remediation is required because:

(1) The contaminant concentrations remaining in the area of concern or the site are more than an order of magnitude greater than the numerical remediation standard applicable at the time of comparison;

(2) The area of concern or site was remediated using engineering and institutional controls approved by the Department and these controls are no longer protective of public health, safety and the environment; or

(3) The area of concern or the site were remediated to an approved site specific remediation standard and some or all of the factors and assumptions which were the basis for deriving the site specific remediation standard are no longer valid;

iii. The area of concern or site does not contain contaminants above the numerical remediation standard applicable at the time of comparison and no further remediation is required; or

iv. The contaminant concentration remaining in the area of concern or the site is more than order of magnitude greater than the numerical remediation standard applicable at the time of comparison. Any person who is liable for contamination pursuant to N.J.S.A. 58:10-23.11g may be required to conduct further remediation.

(b) The documentation required for (a)5 above shall include a table comparing the levels of contaminants remaining in the area of concern, the numerical remediation standards which are contained in the approved remedial action workplan and the numerical remediation standards applicable at the time of comparison. The table shall contain all sampling results, including, but not limited to, sample location, sample media, field and laboratory identification numbers, method detection limits as necessary, and analytical results for the area of concern.

(c) The Department will determine the extent to which prior submissions or completions may satisfy the specific items required for the preliminary assessment. If the Department approves any such prior work in writing, then that work may be included as part of the preliminary assessment.

7:26E-3.3 Site investigations

(a) The purpose of a site investigation is to determine if any contaminants are present at the site, or as necessary, have emanated or are emanating from the site above any of the applicable unrestricted use remediation standards or if no further

remediation is required. If such contaminants are present at the site, then additional remediation is necessary.

(b) A site investigation shall be conducted based upon the information collected pursuant to the preliminary assessment requirements in N.J.A.C. 7:26E-3.1 and shall satisfy all of the following requirements:

1. The general sampling requirements in N.J.A.C. 7:26E-3.4;

2. The building interior sampling requirements in N.J.A.C. 7:26E-3.5, if applicable;

3. The soil sampling requirements in N.J.A.C. 7:26E-3.6;

4. The ground water sampling requirements in N.J.A.C. 7:26E-3.7, if applicable;

5. The surface water and sediment sampling requirements in N.J.A.C. 7:26E-3.8, if applicable;

6. The area specific sampling requirements in N.J.A.C. 7:26E-3.9;

7. The background soil sampling requirements in N.J.A.C. 7:26E-3.10, if applicable;

8. The ecological evaluation requirements in N.J.A.C. 7:26E-3.11; and

9. The historic fill requirements in N.J.A.C. 7:26E-3.12, if applicable.

(c) If required pursuant to an oversight document or other applicable rule, the person responsible for conducting the remediation shall submit reports pursuant to N.J.A.C. 7:26E-3.13 in accordance with the schedules contained in the oversight document or other applicable rule.

(d) It is often appropriate to phase the site investigation so that the areas of concern most likely to be contaminated above the applicable remediation standards are sampled first. If at any time during the site investigation, any contamination is found above the applicable remediation standards, then the site investigation may be discontinued and the remediation continued at either the remedial investigation or remedial action phase.

7:26E-3.4 Site investigation - general sampling requirements

(a) Sampling shall be conducted in all potentially contaminated areas of concern, whether relating to current or former uses of the site to determine whether or not any contaminants are present above the applicable unrestricted use remediation standard.

1. Sampling shall be biased to the suspected location of greatest contamination.

2. Samples shall be biased based on professional judgment, area history, discolored soil, stressed vegetation, drainage patterns, field instrument measurements, odor, or other field indicators.

3. Sampling locations shall comply with requirements listed in N.J.A.C. 7:26E-3.5 through 3.9.

4. If access to sampling locations required pursuant to N.J.A.C. 7:26E-3.5 through 3.12 is impractical due to physical obstructions or safety hazards, and no practical sampling alternatives are available, upon prior verbal or written approval by the Department, sampling may be modified subject to the technical criteria in N.J.A.C. 7:26E-1.6(c)3. Confirmation of any verbal or written approval by the Department shall be provided in the site investigation report. For verbal approvals, the date of the verbal approval and the name of the Department representative who granted the approval shall be provided in written correspondence to the Department within seven days of the verbal approval.

(b) All sampling methods and laboratory analyses shall be conducted pursuant to N.J.A.C. 7:26E-2.1.

(c) Composite sampling shall not be conducted, except as necessary for waste classification pursuant to N.J.A.C. 7:26-8.

7:26E-3.5 Site investigation - building interiors

The site investigation of building interiors shall be conducted when contaminants inside the building have the potential to migrate to the environment outside the building or when contaminants outside the building have the potential to migrate into the building. Minimum requirements for investigating contaminants inside buildings which have the potential to migrate to the environment outside the building are specified in N.J.A.C. 7:26E-3.9, and requirements for investigating contaminants outside buildings which have the potential to migrate into buildings shall be specified by the Department on a site specific basis.

7:26E-3.6 Site investigation - soil

(a) The site investigation shall satisfy the following requirements for all soil investigations:

1. A survey for buried drums, tanks or waste using test pits, ground penetrating radar, magnetometry electromagnetics, or other techniques capable of detecting metal containers and other waste to an average depth of 20 feet or deeper shall be conducted if:

i. There have been any reports of buried drums, tanks or waste;

ii. Ground water contamination is detected and no source has been identified; or

iii. Aerial photographic history of the site indicates the presence of drums, tanks or waste in or adjacent to regraded and/or filled areas.

2. Soil samples shall be collected for chemical analysis and to provide a profile of subsurface conditions. The profile shall meet the following:

i. Logs shall be prepared for all soil samples to document subsurface conditions including, without limitation, soil types and description of non-soil materials, field instrument measurements, depth to ground water, if ground water is encountered and document, if present, soil mottling, presence of odor, vapors, soil discoloration, and free and/or residual product, as determined pursuant to N.J.A.C. 7:26E-2.1(a)11;

ii. Soil shall be classified according to one of the standard systems (for example, Burmeister, Unified, or United States Department of Agriculture);

iii. All borings shall be performed in accordance with the Subsurface and Percolating Waters Act, N.J.S.A. 58:4A-4.1 et seq. In addition, a monitoring well permit shall be obtained from the Department prior to drilling any soil boring greater than 25 feet below grade. For soil borings to a depth of less than 25 feet below grade, the Department recommends soil not be returned to the boring hole. If contaminated materials are returned to the boring hole, then the person responsible for conducting the remediation shall address the presence of this contamination as part of the remedial action workplan; and

iv. Soil sample locations may be photo-documented.

3. Initial characterization soil samples (except samples being analyzed for volatile organics) shall be collected at zero to six inches below grade except as required pursuant to N.J.A.C. 7:26E-3.9 (Area Specific).

4. All soil samples to be analyzed for volatile organics shall be collected as follows:

i. A bulk sampling device that will collect an intact core (e.g., split-spoon) shall be used to minimize contaminant loss during sampling; and

ii. Each core shall be field screened with a properly calibrated direct reading instrument equipped with a photoionization detector (PID), flame ionization

detector (FID), or other suitable instrument capable of detecting the contaminants pursuant to N.J.A.C. 7:26E-2.1(b) to select samples for volatile organics analysis using the following criteria:

(1) If field measurement readings are detected above background:

(A) The coring shall be extended until either background readings are achieved, ground water is encountered, or bedrock is encountered; and

(B) An undisturbed sample from the six-inch interval registering the highest field measurement reading shall be collected, at a minimum, using the appropriate sample collection method and sampling device for volatile organics analysis pursuant to the requirements specified in N.J.A.C. 7:26E-2.1(a)4; or

(2) If all intervals register the same field measurement reading or all field measurement readings do not exceed background:

(A) The coring shall be extended to ground water, bedrock, or 10 feet, whichever is encountered first; and

(B) One undisturbed sample at a minimum, from the six-inch interval at the bottom of the soil boring shall be collected, using the appropriate sample collection method and sampling device for volatile organics analysis pursuant to the requirements specified in N.J.A.C. 7:26E-2.1(a)4; and

iii. Contaminants that cannot be detected with field-screening instruments shall be sampled in accordance with the requirements at N.J.A.C. 7:26E-3.4(a).

5. In all cases, samples shall be collected in discrete six inch increments. If more or less than a six inch increment is sampled because of poor sample recovery or other field logistical problems, an explanation shall be provided in the soil log.

6. Additional sampling of increments below those specified in (a)3 and 4 above shall be completed in cases where the surface has been regraded or if physical evidence in borings indicate the possible presence of contamination.

7. If the designated soil sampling point is within the saturated zone, a sample of the saturated soil shall be collected, when sample recovery is possible, and analyzed.

(b) Soil gas detection methods may be used to bias soil or ground water sample locations. The use of soil gas techniques is recommended, where appropriate, to assist in the evaluation of potentially contaminated or contaminated soil, where extensive

sampling would otherwise be required, such as for lengthy sections of below-grade piping. Guidance for the use of soil gas techniques may be found in the NJDEP "Field Sampling Procedures Manual."

(c) The site investigation of soil shall be conducted:

1. For the purposes of a site investigation pursuant to N.J.A.C. 7:26-3.3(a); and

2. According to the quality assurance and quality control requirements pursuant to N.J.A.C. 7:26E-2.1.

7:26E-3.7 Site investigation - ground water

(a) Except as provided in (b) below, the site investigation of each area of concern shall include at least one ground water sample if any soil contaminant detected in the area of concern has a water solubility greater than 100 milligrams per liter at 20 degrees Celsius to 25 degrees Celsius as documented by a peer-reviewed reference; and

1. All of the soil between the contaminant and the saturated zone is less than 15 percent silt and clay; or

2. Any part of the area of concern at which the soil contamination was detected is located within 2,000 feet of a public supply well, as determined from a map of public supply wells which is available from the Department's Bureau of Revenue, Maps and Publications (609-777-1038) or through the Department's Internet home page (http://www.state.nj.us/dep/njgs, then select "Geodata"). A ground water sample is not required if documentation acceptable to the Department is provided in the site investigation report (N.J.A.C. 7:26E-3.13) demonstrating that ground water sampling was not necessary.

(b) Ground water sampling may not be necessary during a site investigation for a particular area of concern if the person responsible for conducting the remediation documents that ground water contamination from the discharge is unlikely based on the following criteria:

1. The date and duration of the discharge is known;

2. The identity and the volume of the contaminants are known;

3. The date the remediation in response to the single discharge was completed;

4. Post remediation soil sampling data establish that the remediation meets all applicable remediation standards in effect at the time of the remediation, regardless of when the Department is informed of the remediation; and

5. Any other data or information that is relevant to the determination of the likelihood of ground water contamination.

(c) The site investigation of ground water shall be conducted for the purposes of a site investigation pursuant to N.J.A.C. 7:26E-3.3(a) according to the following:

1. The quality assurance and quality control requirements pursuant to N.J.A.C. 7:26E-2;

2. Ground water samples may be taken pursuant to any generally acceptable sampling method pursuant to N.J.A.C. 7:26E-1.6(c). Sampling methods generally acceptable to the Department include, but are not limited to, those specified in the NJDEP Field Sampling Procedures Manual or the NJDEP Alternative Ground Water Sampling Techniques Guide in effect as of the date on which the sampling is performed; and

3. The ground water sampling points shall be located in:

i. The excavation of any source(s) of contaminants, if possible, including without limitation, tanks, tank distribution systems, and underground injection control (UIC) units such as seepage pits, septic systems, dry wells or other injection wells regulated under N.J.A.C. 7:14A-5; or

ii. The expected downgradient flow direction of the area of concern and within 10 feet of the area of concern; ground water flow direction shall be predicted based on topographic relief, the location of surface water bodies, structural controls in the bedrock or soils, location of pumping wells and subsurface conduits at or below the water table. Ground water flow direction may also be predicted based on data from adjacent sites if ground water flow direction at the adjacent site has been determined pursuant to N.J.A.C. 7:26E-3.7(e)3iv.

(d) The minimum number of ground water samples collected shall be as follows:

1. At least one ground water sample for each area of concern which is classified as an Underground Injection Control (UIC) unit including, without limitation, seepage pits, septic systems, dry wells or other injection wells regulated under N.J.A.C. 7:14A-5 sampled pursuant to N.J.A.C. 7:26E-3.9(e)3;

2. At least one ground water sample for sites with leaking underground storage tanks and tank fields containing up to three tanks with a maximum capacity of 10,000 gallons per tank. If a leaking tank is excavated, the ground water sampling point shall be located within the excavation, if possible;

3. Pump islands and associated piping greater than 25 feet from the tank field shall be considered separate areas of concern and shall require a separate ground water sample location; and

4. At least one ground water sample for all other areas of concern unless the area of concern is within 10 feet hydraulically upgradient of a ground water sampling location.

(e) The results of each ground water site investigation analysis shall be evaluated as follows:

1. If the contaminant concentrations found in all ground water samples are below the applicable remediation standards, no further remediation is necessary for ground water;

2. If the contaminant concentrations found in any ground water samples exceed the applicable remediation standards, the ground water may be resampled to confirm the presence of contamination; this confirmation sampling shall include at least two additional samples taken over a 30 day period, the results of which may be averaged with the original result to determine compliance with the applicable remediation standards; and

3. If ground water contamination is confirmed, the person responsible for conducting the remediation shall, except as provided in (f), below:

i. Within six weeks after identifying ground water contamination, conduct a well search including:

(1) Locating wells through a file search using all available Department, county and local records for all monitoring and domestic wells within one-half mile of each point of groundwater contamination, and all irrigation, industrial, public supply wells, and wells with water allocation permits within one mile of the area of concern. Available Department records include without limitation, paper, microfiche, electronic and antique well records maintained by the Bureau of Water Allocation. The Department Geographic Information System shall be used as part of the file search. If the site is located in a groundwater use area the Department will determine if further action, such as a door-to-door survey, is required;

(2) Identifying the type of well and the status of the well (active, inactive, properly abandoned pursuant to N.J.A.C. 7:9D), including, as available, total depth, casing length, open bore hole or screened interval, copies of well records and/or well logs on file with the Department's Bureau of Water Allocation, and any additional records available in county or municipal records; and

(3) Documenting all sources referenced in performing the well search, including agencies that were unable to provide the information requested, including the name of the person within each agency that was contacted and when, and that the request for information was denied or information was unavailable;

ii. Within two weeks after completing the well search, determine if any potable wells exist within 1000 feet of each area of concern with groundwater contamination and:

(1) Within 24 hours after determining the existence of a potable well, notify the assigned case manager by telephone. If a case manager is not assigned, notify the Department hotline at 1-877 WARNDEP or (877) 927-6337;

(2) Within eight weeks after identifying the potable wells, sample each existing potable well identified pursuant to the well search suspected to be contaminated by the site in question; and

(3) Within 45 days after completing sampling of the potable wells, submit all analytical results to the Department as full laboratory data deliverables, pursuant to N.J.A.C. 7:26E-2(a)13.

iii. Perform the following actions if any of the analytical results for the potable well samples collected pursuant to (e)3ii(2) above indicate that any of the potable wells are contaminated above the drinking water standards for contaminants that are suspected to be from the site:

(1) Within two weeks after submitting the analytical results to the Department, identify each potable well that exists within 1000 feet to one-half mile of each area of concern with groundwater contamination and perform all sampling and reporting requirements as set forth at (e)3ii; and

(2) Repeat the process of identifying and sampling potable wells pursuant to (e)3i, ii and iii(1) above, by identifying and sampling potable wells at each successive half-mile intervals until either no more potable wells are identified, or no contaminants above the drinking water standard are identified;

iv. Determine the direction of groundwater flow for each affected aquifer as follows:

(1) Install a minimum of three groundwater monitoring wells or piezometers in each affected aquifer or water bearing zone to determine the

groundwater flow direction in that zone. Install and survey the monitoring wells or piezometers pursuant to N.J.S.A. 58:4A-4.1 et seq. and N.J.A.C. 7:26E-4.4(g) to provide for adequate triangulation;

(2) Collect a minimum of two rounds of synoptic static water levels a minimum of 30 calendar days apart to provide a more accurate indication of the groundwater flow direction. The water levels may be taken to evaluate seasonal variations in flow direction;

(3) If the site is located in an area that is tidally influenced, synoptic ground and surface water levels shall be collected during two fair weather sampling events separated by a minimum 30-day period where each event entails collecting hourly water levels from all applicable wells and the surface water for a minimum 71 hour period; and

(4) Collect water level measurements and determine groundwater flow direction, taking into account activities in the area which may affect flow direction, such as pumping wells or seasonally used pumping wells and injection wells; and

v. Conduct a groundwater remedial investigation pursuant to N.J.A.C. 7:26E-4.4.

(f) A prospective purchaser shall commence a potable water investigation no later than 30 calendar days after acquiring the property, in accordance with the requirements and schedule in (e)3, above.

(g) To support a claim that all or part of groundwater contamination detected in onsite groundwater samples is caused by background groundwater contamination, a background groundwater investigation shall be conducted as follows:

1. Groundwater flow direction shall be determined pursuant to N.J.A.C. 7:26E-3.7(e)3iv;

2. A minimum of one background monitoring well shall be installed in each water bearing zone that is believed to contain background ground water contamination. A sufficient number of additional monitoring wells shall be installed to evaluate all offsite sources potentially affecting onsite ground water quality. All monitoring wells shall be installed in accordance with N.J.S.A. 58:4A-4.1 et seq. and N.J.A.C. 7:9D. Each background monitoring well shall be located:

i. Beyond the influence of all onsite areas of concern;

ii. At the upgradient property boundary of the site, as determined by 7:26E-3.7(e)3iv;

iii. Such that the offsite ground water impacting this well will migrate along a predicted ground water flow path that will intercept the area of concern; and

iv. Outside the zone of influence of any nearby pumping wells that would prevent upgradient ground water from flowing onto the site;

3. Background monitoring well(s) shall be sampled concurrently with collection of onsite ground water samples for all onsite contaminants believed to be originating from background sources;

4. Results of the background ground water investigation shall be evaluated as follows:

i. No further remediation is required for ground water if:

(1) Contaminants detected in the area of concern monitoring well, as well as the contaminants' parent products, were never historically used on the site as documented pursuant to N.J.A.C. 7:26E-3.1 and 3.3;

(2) There is no additional evidence of an onsite discharge; and

(3) Contamination is present in the background monitoring well(s); and

ii. Additional remediation may be required when contamination is present in the area of concern monitoring well but not in the background monitoring well or contamination is present in both the area of concern monitoring well and the background monitoring well. In these cases, the Department shall consider the contribution of the background contamination in the determination of the applicable ground water remediation standards for the site. Factors for determining the contribution of the offsite contamination to onsite contamination shall include, but not be limited to, contaminant attenuation rates, contaminant degradation rates, and ground water flow velocity; and

5. The person responsible for conducting the remediation shall notify the Department pursuant to N.J.A.C. 7:26E-1.4(g) if that person determines, pursuant to (f)4 above, that ground water contamination exists upgradient of the site. The person responsible for conducting the remediation shall notify their assigned case manager, or if they are not assigned a case manager, the Department hotline at (1-877 WARNDEP or 1-877-927-6337).

7:26E-3.8 Site investigation - surface water and sediment

(a) If a surface water body is on or adjacent to the site, the person responsible for conducting the remediation shall determine if there is any evidence that discharges to

the surface water body have occurred or are occurring. Such evidence shall include, without limitation:

1. Known historical or on-going discharges to the surface water body, as determined pursuant to N.J.A.C. 7:26E-3.1;

2. Stressed vegetation, sheens, seeps, discolored soil or sediment along the shoreline or on the surface water body;

3. Evidence of stream impacts from historical discharges including historical ecological studies documenting differences in organism population density and diversity in areas potentially impacted by the site relative to areas not impacted by the site; or

4. Existing onsite ground water contamination in excess of the applicable State Surface Water Quality criteria, N.J.A.C. 7:9B or the Federal Surface Water Quality criteria, 40 C.F.R. Part 131, whichever is more stringent, which discharges to the surface water body. Onsite ground water contamination in excess of the applicable surface water criteria shall be delineated to the applicable surface water criteria. Ground water delineation samples shall be collected along the ground water flow path between the area of concern and the surface water body and analyzed for applicable contaminants.

(b) If there is evidence that discharges to the surface water body have occurred, pursuant to (a) above, then a surface water investigation is required. The investigation of surface water and sediment shall be conducted according to the following:

1. The quality assurance and quality control requirements pursuant to N.J.A.C. 7:26E-2;

2. Surface water samples are required to evaluate standing water bodies, or, for flowing water, upgradient, downgradient, and discharge point water samples are required when there is reason to believe surface water may have been impacted by contamination emanating from the site. Sampling shall be designed to account for seasonal or short-term flow and water quality fluctuations due to dry versus wet weather flow, system hydraulics (obtaining flow-proportioned samples where applicable) and potential contaminant characteristics (for example, density, solubility); and

3. Sediments in surface water bodies shall be analyzed when there is reason to believe sediments may have been impacted by contamination emanating from the site as follows:

i. Sediment sampling for streams and similar water bodies shall be completed in accordance with N.J.A.C. 7:26E-3.9(d)3 (Swales/ Culverts).

ii. Sediment sampling for ponded bodies of water shall be completed in accordance with N.J.A.C. 7:26E-3.9(c) (Surface Impoundments).

iii. In addition to other required analyses, surface water sediments shall also be analyzed for total organic carbon, pH, and particle size. These data are required to develop appropriate remediation standards.

7:26E-3.9 Site investigation - area specific requirements

(a) The site investigation shall also satisfy the following sampling requirements for bulk storage tanks and appurtenances, including, without limitation, all in-use and out of service storage tanks with a storage capacity greater than 55 gallons, and associated piping and fill points.

1. For above ground tanks over unpaved soil:

i. Sampling around tanks with shell or bottom in direct contact with soil now or in the past shall meet all the following criteria:

(1) Sampling to detect surface contamination shall be conducted around the base of the tank with at least one sample per 100 linear feet, and shall include expected areas of contamination based on soil discoloration/odors, history of repairs/replacement, soil beneath valves, or low areas where spills or leaks from valves may accumulate.

(2) Unless the tank has always been in compliance with N.J.A.C. 7:1E-2 and has no discharge history, at least one boring shall be located adjacent to or within two feet of the tank and continuous two foot split spoon sampling performed to the water table (if water table is less than 10 feet). The sample in each boring evidencing the highest apparent contamination based on soil discoloration, odor, field screening result or other field indicator shall be laboratory analyzed. If there is no evidence of contamination, samples shall be collected from the zero to six inch interval above the saturated zone. At least one boring shall be located in the expected downgradient ground water flow direction from the tank. For tanks in excess of 100 feet in circumference, at least three borings, spaced equidistantly, are required.

(3) In cases where the depth to ground water is greater than 10 feet, sampling shall be conducted to 10 feet as in (a)1i(2) above. If there is no evidence of contamination, samples shall be collected at 9.5 to 10 feet.

ii. Elevated tanks (that is, shell or bottom not in contact with ground) require soil sampling when there is any physical or documentary evidence of discharges, when soil discoloration is observed or when field monitoring or other evidence indicates that a discharge has occurred.

(1) At least one soil sample shall be taken below tanks which store or may have stored hazardous substances, hazardous wastes, or pollutants that do not cause obvious soil discoloration (such as volatile organics), in the area most likely to be contaminated, including without limitation, valve or former leak or rupture areas. If samples cannot be obtained from below the tank because soils are not accessible to sampling equipment, the sample may be located within two feet of the tank.

2. For above ground tanks over paved surfaces:

i. Soil around above ground tanks on paved surfaces shall be sampled pursuant to (b)1 below (Pads) if there are stained soils adjacent to pad or if the potential contaminant would not cause discoloration (volatile organics), or if there is a history of spillage or other evidence that a discharge has occurred.

ii. Tanks within a paved containment area shall be sampled at the drainage discharge point, if one exists, pursuant to (d) below (Drainage Areas).

iii. Soil sampling below the pavement shall be conducted only when the pavement has deteriorated so as to allow potential contaminant contact with the soil, or if pavement was not present over the life of the tank or former tanks.

iv. Instead of sampling soil beneath pavement, samples around the pad may be taken pursuant to (b)1 below subject to the Department's review of documentation pursuant to N.J.A.C. 7:26E-1.6(c) specifying why boring through pavement was not considered practical (for example, concrete slabs with berms, synthetic liners).

3. For underground storage tanks:

i. Underground storage tanks and distribution systems containing potential contaminants shall be evaluated to identify any past or present discharges. No sampling is required for tanks and distribution systems which have always had secondary containment and leak detection pursuant to N.J.A.C. 7:14B and no discharge history. At least four soil samples around each tank shall be collected. If tanks will be closed, refer to N.J.A.C. 7:26E-6.3(b) for requirements.

(1) The soil samples shall be collected within two feet of the tank with one sampling location located at each end, and additional sampling locations located along the length of the entire tank pursuant to (a)3i(2) below;

(A) If sampling within two feet of the tank is not possible due to the presence of bedding gravel, or there are safety considerations (such as danger of tank puncture), which have been identified through field investigations or review of as built plans, soil samples shall be taken as close as possible to the tank. However, no samples shall be collected from further than five feet from the tank and a ground water sample shall be collected within five feet and down-gradient of the tank.

(B) If, because of safety considerations, the distance between adjacent tanks precludes locating soil samples between the tanks, a ground water sample may be collected within five feet and down gradient of the tanks, at the appropriate depth in lieu of the required soil samples between the tanks;

(2) The total number of required sampling locations per tank are as follows:

Total Tank Capacity (Gallons)	Approximate Tank Length (Feet)	Minimum Number of Sampling Locations
56-2,000	to 10'	4
2,001-10,000	to 30'	6
10,001-25,000	to 40'	8
25,000+	to 40'+	10

(3) Soil samples collected for analysis shall be taken at zero to six inches below the tank bottom unless the tank is within the saturated zone (see (a)3ii(5) below);

(4) Additional soil samples for volatile organics analysis shall be collected in accordance with the requirements at N.J.A.C. 7:26E-3.6(a)4.

(5) For underground storage tanks within the saturated zone:

(A) If volatile organic compounds are considered potential contaminants, either a soil investigation shall be conducted as stated in (B) below, or a ground water sample shall be collected at the appropriate depth pursuant to N.J.A.C. 7:26E-3.7(c) through (e);

(B) If volatile organic compounds are not considered potential contaminants, a soil investigation shall be conducted. For a soil investigation, samples shall be collected zero to six inches above the saturated zone if the potential contaminant's density is less than water,

and zero to six inches below the depth of the tank bottom if the potential contaminant's density is greater than water;

ii. Precision tests pursuant to N.J.A.C. 7:14B-6.5(a)3 may be used in lieu of soil samples if tanks are beneath buildings or otherwise inaccessible and it is the original tank with no history of leaks or repairs, or if there is insufficient soil to collect a sample (for example, tank is located in bedrock).

iii. To verify tank contents for out of service tanks, one sample shall be taken of any product or residue remaining in the tank and analyzed using ASTM fingerprint method D3328 or other appropriate method.

4. For all above grade piping:

i. Sampling is necessary if there is evidence of a discharge (for example, discolored soil, etc.) or reports of past discharges.

ii. Any sampling conducted shall be pursuant to (e) below (Discharge/Disposal Areas).

5. For all below grade piping:

i. Below grade piping shall be evaluated to identify any past or present discharges using soil samples located zero to six inches below the piping and within two feet of piping unless the system has always had secondary containment with leak detection pursuant to N.J.A.C. 7:14B and no discharge history. Samples for volatile organic compounds shall be collected in accordance with the requirements at N.J.A.C. 7:26E-3.6(a)4. Precision tests pursuant to N.J.A.C. 7:14B-4.3(j) may be used if the piping is original and there is no history of discharges or repairs.

ii. For total piping length of one to 15 feet, a minimum of one soil sample shall be collected. An additional soil sample shall be collected for each additional 15 linear feet of piping or portion thereof from 16 to 50 feet of piping length. Sampling locations shall be biased to include joints, dispensers, and other potential discharge areas.

iii. Piping runs within two feet of another pipe run may be considered a single pipe run. Soil samples for multiple pipe lines shall be collected midway between/among the lines, or biased toward any pipe for which evidence of a discharge exists. For pipes that are separated by a distance greater than two feet vertically, soil samples shall be collected below each pipe, pursuant to (a)5i above.

iv. For total piping lengths in excess of 50 feet, sampling frequency may be reduced subject to the Department's review of documentation pursuant to N.J.A.C. 7:26E-1.6(c) specifying why the reduced number was considered adequate.

6. For all loading and unloading areas:

i. Exposed soils at loading or unloading areas associated with tanks shall be sampled at a minimum rate of one sample per fill connection or valved discharge point;

ii. For loading or unloading points located over impervious cover, sampling shall be conducted pursuant to N.J.A.C. 7:26E-1.6(b)1 below (Pads).

(b) The site investigation shall also satisfy the following requirements for all storage and staging areas, dumpsters and transformers, whether temporary or permanent, including exposed soil areas adjacent to above ground vessels on pads; tank loading/unloading areas on pads; dumpster staging areas; electrical transformers, heat exchanger and other outdoor equipment and drum storage pads.

1. For all pads:

i. Pads shall have a minimum of one sampling location per side adjacent to exposed soil for sides up to 30 feet long; for sides greater than 30 feet long, one additional sample location is required for each additional 30 feet of length;

ii. Each sampling point shall be located immediately adjacent to the pad and biased toward the expected location of greatest contamination;

iii. If a pad shows evidence of deterioration that may allow contaminant contact with the soil, or its surface has been modified (repaved), or aerial photographs or site history indicate potential for previous discharges to the soil, soil samples beneath the pad shall be collected pursuant to N.J.A.C. 7:26E-1.6(b)2ii below; and

iv. Bermed pads and pads surrounded by impermeable cover shall be sampled at any drainage discharge point pursuant to (d) below (Drainage Areas).

2. For all storage and staging areas over permeable cover:

i. Storage and staging areas with evidence of discharges which are or were used for storage of hazardous substances, hazardous wastes, or pollutants shall be sampled pursuant to (e) below (Spills/ Disposal Areas).

ii. Sample frequency shall be one per 900 square feet of surface area to characterize soils below a storage or staging area up to 300 feet in perimeter with a minimum of one sample. Sample frequency may be reduced for larger areas subject to the Department's review of documentation pursuant to N.J.A.C. 7:26E-1.6(c) specifying why sample frequency was considered adequate. Sampling locations shall be biased toward the suspected location of greatest contamination based on low points, drainage patterns, discoloration, stressed vegetation, field instrument measurements or other field indicators.

(c) The site investigation shall satisfy the following requirements for all surface impoundments, including without limitation, lagoons, fire ponds, waste ponds or waste pits, storm water detention basins, excavations, natural depressions or diked areas, which are designed to hold an accumulation of liquid substances or substances containing free liquids. Active surface impoundments with impermeable liners which may be damaged as a result of sample collection shall have liner integrity verified by physical inspection and/or evaluation of monitoring well water quality data associated with the surface impoundment, if available.

1. Sediments within all unlined surface impoundments shall be sampled if the impoundment receives runoff from areas of potential contaminant sources;

2. Sediment sample locations shall be biased towards inflow/ outflow areas, and areas where sediments may be expected to accumulate;

3. Core samples shall be taken for contaminant analysis and to fully characterize sediment type, thickness of sediment layers, and vertical extent of sediment.

4. Distinct layers of sediments thicker than six inches, as evidenced by color, particle size, or other physical characteristics, shall be sampled individually.

5. Sediment quantity within the surface impoundment shall be estimated.

(d) The site investigation shall also satisfy the following requirements for all drainage systems.

1. For all floor drains and collection systems, if there is reason to believe contaminants were discharged into the floor drain or collection system:

i. The point of discharge for any floor drain or collection system shall be sampled if the system discharges or ever may have discharged to soil, ground water or surface water;

ii. If the point of discharge is unknown, tracer tests (for example, dye or smoke) shall be conducted to determine the discharge point(s);

iii. Collection system integrity shall be documented by representative soil sampling at potential leak areas, video inspection, hydrostatic test or pressure test. Other methods may be acceptable, subject to the Department's review of documentation pursuant to N.J.A.C. 7:26E-1.6(c) specifying why the methods were considered effective; and

iv. Sampling soil below floor drains, or collection system laterals, shall be conducted when corrosives (as defined in N.J.A.C. 7:26 or, if plastic piping is or was used, organic solvents are considered corrosive) are or were discharged to floor drains or the collection system or there has been a history of collection system discharges, rupture or repairs. In such cases, representative soil sampling at known or suspected leak areas is required for potential contaminants.

2. Soil at each roof leader discharge point shall be sampled if storage units or process operations using hazardous substances, hazardous wastes, or pollutants vent or may have vented to the roof;

3. For all swales and culverts:

i. Sampling shall be conducted when the swale/culvert receives or received runoff from other contaminated areas of concern;

ii. Sediment and soil sampling shall be conducted at the points where contamination from runoff/spills enter or have entered the drainage system; and

iii. If flow could have scoured sediments from the receiving structure, sampling shall be conducted at onsite downgradient structures laden with sediments;

4. For all storm sewer and spill containment collection systems:

i. Sampling shall be conducted when the collection system is or was the runoff/spill discharge point from other contaminated areas of concern;

ii. Sediment sampling shall be conducted at the manhole, catchbasin, sump, or other structure where contaminated runoff or discharges enter the drainage system;

iii. Sampling shall be conducted in the soils around catch basins, manholes, sumps or other structures which contain or may have contained hazardous substances, hazardous wastes, or pollutants, and are not hydraulically sound (that is, water percolates through the floor and walls), through the use of adjacent soil borings. A single boring located within two feet of the downstream side of the structure shall be sampled at a depth corresponding to the bottom of the

structure. Samples for volatile organic compounds shall be collected in accordance with the requirements at N.J.A.C. 7:26E-3.6(a)4; and

iv. Ground water discharging from storm sewer systems which contain dry weather flow (that is, five days following the most recent rainfall) shall be sampled at the discharge point and analyzed for potential contaminants discharged or potentially discharged into the system; and

5. For all boiler and compressor discharges, if there is reason to believe a potential contaminant discharge has occurred, sampling shall be conducted pursuant to (e) below (Discharge/Waste Disposal Areas).

(e) The site investigation shall also satisfy the following requirements for all discharge and waste disposal systems and areas.

1. For any discharge areas and areas of discolored soil or stressed vegetation where specific requirements are not otherwise provided in this section:

i. Each distinct area shall be evaluated independently as an area of concern; and

ii. Initial characterization samples shall be biased based on field indicators such as soil discoloration, stressed vegetation, or field instrument measurements toward those areas of greatest suspected contamination. Sample frequency shall be at least one sample for every 900 square feet for areas up to 300 feet in perimeter. Sample frequency may be reduced for larger areas, subject to the Department's review of documentation pursuant to N.J.A.C. 7:26E-1.6(c) specifying why the reduced sample frequency was considered adequate.

2. Above ground treatment systems shall be sampled pursuant to the requirements for the functional portions of the system pursuant to (a) above (Tanks). For example, any above ground waste treatment tanks over unpaved soil shall be sampled pursuant to (a)1 above.

3. For below grade wastewater treatment systems:

i. For tanks, septic tanks, separators, and neutralization pits, two samples shall be collected from within the tank, one aqueous and one sludge sample, for analysis unless documentation acceptable to the Department pursuant to N.J.A.C. 7:26E-1.6(c) is provided in the site investigation report (N.J.A.C. 7:26E-3.13) specifying why such sampling was not considered necessary to confirm that only sanitary waste was discharged to the system during the entire life of the system. Documentation shall include, without limitation, an affidavit certifying that only sanitary waste was ever discharged to the system and that no present or

former floor drains, sinks, or other units in process areas were ever connected to the system.

ii. For septic disposal fields:

(1) Soil borings shall be completed as specified below for onsite disposal fields unless documentation acceptable to the Department is provided in the site investigation report (N.J.A.C. 7:26E-3.13) specifying why soil borings were not considered necessary to confirm that only sanitary waste was discharged to the system pursuant to (e)3i above.

(2) At least one boring per 500 square feet of field area shall be completed, with a minimum of four borings per disposal field.

(3) Borings shall be located within two feet of the edge of the bed area in active disposal fields, but shall be angled so that samples are taken below the infiltrative surface as defined in N.J.A.C. 7:9A-2.1, and directly below laterals within abandoned fields.

(4) Borings shall be located to include the first five feet of the infiltrative surface as defined in N.J.A.C. 7:9A-2.1 and shall be spaced so that samples are representative of the entire disposal field.

(5) Soil samples shall be taken at a depth corresponding to zero to six inches below the bottom of the infiltrative surface as defined in N.J.A.C. 7:9A-2.1.

(6) Samples for volatile organic compounds shall be collected in accordance with the requirements at N.J.A.C. 7:26E-3.6(a)4.

iii. For cesspools, seepage pits, as defined in N.J.A.C. 7:9A-2.1, and dry wells:

(1) Sampling shall be conducted in accordance with (e)3iii(2) through (5) below, unless documentation acceptable to the Department is provided in the site investigation report (N.J.A.C. 7:26E-3.10) specifying why sampling was not considered necessary, for example, to confirm that only sanitary waste or storm water was discharged to the system pursuant to (e)3i above;

(2) One representative sample of sludge/sediment in each pit shall be obtained for laboratory analysis;

(3) A soil boring shall be placed within two feet of the suspected downgradient side of the pit and shall extend to a minimum of two feet below the pit bottom. The soil shall be cored and inspected for evidence of

discharge and samples collected in accordance with N.J.A.C. 7:26E-3.4(a)1 and 2. Samples for volatile organic compounds shall be collected in accordance with the requirements at N.J.A.C. 7:26E-3.6(a)4.

(4) If the pit bottom is within two feet of the saturated zone or bedrock, a ground water sample will be obtained within two feet of the suspected downgradient side of the pit; and

(5) At a minimum, the laboratory analysis shall target the contaminants suspected to have been discharged to the seepage pit.

iv. Collection lines shall be sampled pursuant to (d)1 above (Floor Drains).

(f) The site investigation shall also satisfy the following requirements for any other potentially contaminated areas away from process areas not otherwise addressed pursuant to (a) through (e) above:

1. The sample locations shall be biased toward suspected areas of the greatest contamination. If there is no basis for biasing, then random sampling of these areas is required as follows, except as provided in (f)2 below:

i. The area to be sampled shall be gridded and each grid node given an identification number;

ii. The grid nodes chosen for sampling shall be based on the numbers selected from a random number chart;

iii. Areas of less than 10 acres shall be sampled at a rate of at least one sample for every two acres; and

iv. Areas greater than 10 acres may be sampled at a reduced frequency subject to the Department's review of documentation pursuant to N.J.A.C. 7:26E-1.6(c) specifying why a reduced frequency was considered appropriate, but a minimum of five locations shall be sampled.

2. If the person responsible for conducting the remediation documents, pursuant to N.J.A.C. 7:26E-1.6(c), that the area is not and has not been used for any purpose which may have included hazardous substances, hazardous wastes, or pollutants, including, without limitation, the activities described in (a) through (e) above, then no samples are required. Such documentation shall be based upon the following:

i. An aerial photographic history pursuant to N.J.A.C. 7:26E-3.1(c)1vi (Preliminary Assessment); and

ii. An affidavit signed by the person certifying the site investigation attesting that, based on diligent inquiry, no potential contaminants were discharged in the area.

7:26E-3.10 Site investigation - background investigation in soil

(a) If during the site investigation, a suspected contaminant is found in any area of concern in excess of the applicable remediation standard, the following approach may be used to demonstrate to the Department that the contaminant concentration is due to natural background:

1. Demonstrate that a previous background investigation in the region of the site, conducted pursuant to (a)3 below, identified contaminant concentrations in soil in the region of the site at the same concentration as the soil found on the site under investigation;

2. Demonstrate that the contaminant concentrations at the site are due to natural background conditions as follows:

i. The contaminant of concern was never used, stored, or disposed on the site as documented pursuant to N.J.A.C. 7:26E-3.1;

ii. The chemical concentrations detected in the soil at the site are within the ranges reported in appropriate references for background levels for New Jersey;

iii. The distribution of the chemical in the soil does not follow a concentration gradient indicative of a discharge; and

iv. Soil boring logs indicate the samples were not collected from historic fill material; or

3. Conduct a background soil investigation as follows:

i. A minimum of 10 background samples shall be collected from onsite or in the region of the site. Two samples shall be collected from each of five locations with one sample collected at a depth of zero to six inches and one sample at a depth of greater than 12 inches at each location;

ii. Background samples shall be collected at locations unaffected by current and historic site operations as documented by the preliminary assessment, including aerial photographs. Wherever possible, background samples shall be collected from locations which are topographically upgradient and upwind of contaminant sources;

iii. Background samples shall not be collected from the following areas:

(1) Parking lots, roads, or roadside areas;

(2) Areas where potential contaminants were loaded, handled, or stored;

(3) Waste disposal areas;

(4) Areas near railroad tracks;

(5) Areas of historic fill material;

(6) Areas receiving runoff from areas (a)3iii(1) to (5) above or from adjacent sites;

(7) Storm drains or ditches receiving runoff from the site or adjacent sites; or

(8) Any other area of concern;

iv. Background samples shall be collected and analyzed using the same methods as were used for area of concern samples;

v. Background samples shall be collected from soil types similar to the area of concern samples. Similar soil types shall be identified using standard classification systems pursuant to N.J.A.C. 7:26E-3.6(a)2ii;

vi. The background data set shall be examined for statistical outliers as follows:

(1) An outlier is defined as a concentration greater than 1.5 times the range of the 25th to 75th percentile, plus the concentration of the 75th percentile. For example, if the 75th percentile concentration in a data set is nine ppm and the 25th percentile is three ppm, subtract three from nine and multiply the result by 1.5. This would equal nine ppm. Add the result to the 75th percentile for a concentration of 18 ppm. Any sample point above 18 ppm would be considered an outlier. The background sample data shall be transformed to natural logarithms before performing the outlier test because it is assumed that natural background chemical concentrations are log normally distributed; and

(2) An outlier shall not be considered part of background unless the chemical concentration is confirmed with the analysis of an additional sample from the outlier location. If the difference between the original and confirmation sample results is no greater than 20 percent, the average

concentration of the two samples shall be considered the highest background concentration;

vii. The highest contaminant concentration found in the background samples shall be applied as an upper limit for the contaminant concentrations found on the site. If contaminant concentrations are found at any sampling location on the site exceeding the highest concentration found in the background samples, a remedial investigation shall be conducted; and

viii. Samples collected for area of concern investigation shall not be averaged for background comparisons.

(b) If during the site investigation a contaminant concentration is found in any area of concern in excess of the applicable remediation standard, it may be demonstrated to the Department that the elevated contaminant concentration is not due to an onsite discharge on a case by case basis.

7:26E-3.11 Site investigation - ecological evaluation

(a) A baseline ecological evaluation shall be completed for each contaminated site or area of concern, except an area of concern that consists of an underground storage tank storing heating oil for on-site consumption in a one to four family residential building. This baseline evaluation shall be qualitative in nature and based on site investigation sample results and a site inspection by a person experienced in the use of techniques and methodologies for conducting ecological risk assessments in accordance with EPA guidance. This evaluation shall be used to determine when further sampling and evaluation is required, pursuant to N.J.A.C. 7:26E-4.7. The results of the baseline evaluation shall be included as part of the site investigation report submitted to the Department. The baseline ecological evaluation shall:

1. Evaluate all data identified or collected in the preliminary assessment and the site investigation to identify all of the site-specific contaminants that are of ecological concern. Contaminants of ecological concern shall include, without limitation, those that exhibit the ability to biomagnify or bioaccumulate, or contaminants with concentrations that exceed applicable standards, criteria or guidelines recommended by the Department, NOAA, U.S. Department of the Interior, EPA or other Federal natural resource agencies for use in conducting ecological assessments and investigations. Such standards, criteria and guidelines shall include, without limitation:

i. For sediments:

(1) EPA, Briefing Report to the EPA Science Advisory Board on the Equilibrium Partitioning Approach to Generate Sediment Quality Criteria, EPA 440/5-89-002;

(2) EPA, Technical Basis for Deriving Sediment Quality Criteria for Nonionic Organic Contaminants for the Protection of Benthic Organisms by Using Equilibrium Partitioning, EPA-822-R-93-011;

(3) Long, E.R., and D.D. MacDonald, S.L. Smith and F.D. Calder, Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuarine sediments, Environmental Management 19:81-97, 1995; and

(4) Persaud, D., R. Jaagumagi, and A. Hayton, Guidelines for the Protection and Management of Aquatic Sediment Quality in Ontario, Environmental Monitoring and Reporting Branch, Ontario Ministry of the Environment, Ottawa, 24p., 1993;

ii. For surface water:

(1) Federal Surface Water Quality Criteria for Acute/Chronic Aquatic Life Protection, 40 C.F.R. Part 131; and

(2) New Jersey Surface Water Quality Standards, N.J.A.C. 7:9B;

iii. For soil:

(1) Contaminant Hazard Reviews, Fish and Wildlife Service, U.S. Department of the Interior, various dates, Eisler, R.; and

(2) Toxicological Benchmarks for Screening Potential Contaminants of Concern for Effects on Terrestrial Plants: 1994 Revision, Oak Ridge National Laboratory, Oak Ridge, TN, Will, M.E. and G.W. Suter II;

iv. Other peer-reviewed published literature on the impact that specific contaminants have on non-human species;

2. Identify environmentally sensitive natural resources within the site boundaries and on properties immediately adjacent to the site. The boundaries of these sensitive areas shall be defined to the extent necessary to estimate the sensitive area size and location with respect to the contaminated site or area of concern. The Department of Geographic Information System shall be used as a source of information for identifying these sensitive areas;

3. Identify potential contaminant migration pathways to any environmentally sensitive natural resources identified in (a)2 above; or any observations of potential impact to the identified environmentally sensitive natural resources that might be attributed to site contamination; such observations shall include, but not be limited to:

i. Stressed or dead vegetation;

ii. Discolored soil, sediment or water;

iii. Absence of biota in a specified area of the system as compared to other similar areas of the same system; or

iv. Presence of a seep or discharge; and

4. Draw conclusions regarding the need to conduct further investigations. Continued ecological investigations shall be required during the remedial investigation, pursuant to N.J.A.C. 7:26E-4.7, whenever the baseline evaluation indicates the co-occurrence of the following conditions:

i. Contaminants of ecological concern exist onsite;

ii. An environmentally sensitive natural resource exists on, or immediately adjacent to, the site; and

iii. Potential contaminant migration pathways to an environmentally sensitive natural resource exist, or an impact to an environmentally sensitive natural resource is indicated based on visual observation.

7:26E-3.12 Site investigation - historic fill material

(a) If historic fill material is present at the site, it may be assumed that the fill material is contaminated above an applicable residential soil remediation standard and a remedial investigation of the historic fill material may be conducted pursuant to N.J.A.C. 7:26E-4.6(b).

(b) As an alternative to (a) above, if historic fill material is present at the site, it may demonstrated that the historic fill is not contaminated above the applicable residential soil remediation standards on a case by case basis.

(c) An appropriate number of ground water samples (minimum of one sample) are required when a high degree of certainty is needed to document that ground water is not contaminated, including, without limitation, if the historic fill site is in an area where ground water is used for potable water. All ground water sampling shall be conducted pursuant to N.J.A.C. 7:26E-3.7(c).

7:26E-3.13 Site investigation report

(a) The site investigation report shall present and discuss all of the information identified or collected pursuant to N.J.A.C. 7:26E-3.3 through 3.12.

(b) The site investigation report shall include the following:

1. Historical information pursuant to N.J.A.C. 7:26E-3.2 (preliminary assessment report) unless the remediation is directed at either a specific discharge event, rather than a particular area of a site, or any underground tank or underground tank system;

2. A physical setting section which shall include descriptions of the following unless the remediation is directed at either a specific discharge event, rather than a particular area of concern, or any underground tank or underground tank system:

i. The physical conditions of the site and surroundings, including a general description of soils, geology, hydrogeology, and topography;

ii. Use of, distance to, flow direction, and names of surface water bodies within one-half mile of the site with emphasis upon water bodies topographically or hydraulically downgradient of the site that may receive site discharges or runoff;

iii. The results of the well search conducted pursuant to N.J.A.C. 7:26E-3.7(e)3, using the well search format at Appendix B; and

iv. The direction of ground water flow, as determined pursuant to N.J.A.C. 7:26E-3.7(e)3iv.

3. A technical overview which shall present a general profile of the site investigation execution and results. The following items shall be discussed in the technical overview:

i. Reliability of laboratory analytical data as indicated by compliance with sample holding times, ability to achieve method detection limits and precision and accuracy criteria for the analytical method, and other indicators of data quality;

ii. A summary of the overall nature of contamination on the site, including, without limitation, the numbers of areas of concern requiring further remediation; and

iii. Any significant events or seasonal variation which may have influenced sampling procedures or analytical results; and

4. Findings/recommendations which shall include;

i. A discussion, by area of concern, of the site investigation execution and analytical results. The discussion shall consist of specific findings at the areas of concern;

ii. A discussion of the following items, for each area of concern:

(1) A detailed description of each area of concern including dimensions, suspected and actual contamination, and suspected source of discharge;

(2) Results and implications of field measurements or area-specific changes in sampling protocol due to field conditions;

(3) Significance of information generated in the library search of tentatively identified compounds/unknown compounds; and

(4) Recommendations for either additional remediation or no further remediation for each area of concern.

(c) The site investigation report shall also include the following data and information:

1. Results of all analyses, copies of all laboratory data sheets and the required laboratory data deliverables pursuant to N.J.A.C. 7:26E-2.1 (Quality Assurance Requirements). Laboratory data deliverables may be submitted as a separate attachment;

2. A summary table of analytical methods and quality assurance indicators pursuant to N.J.A.C. 7:26E-2.2(a)1v;

3. A table summarizing all sampling results, including sample location, media, sample depth, field and laboratory identification numbers, analytical results, and comparison to applicable remediation standards organized by area of concern:

i. All contaminant concentrations exceeding the applicable remediation standards shall be identified;

ii. Samples with method detection limits (MDLs) (or practical quantitation levels (PQLs) if available) exceeding the applicable remediation standard shall be identified and an explanation provided in the table key;

iii. Soils/solids sample results shall be reported in milligrams per kilogram on a dry weight basis, and aqueous sample results shall be reported in micrograms per liter;

iv. All ground water data for the same aquifer zone shall be located in the same section of the table; and

v. The data in the summary table shall be presented both as a hard copy and an electronic deliverable using the format outlined in detail in the Site Remediation Program's Electronic Data Interchange Manual in effect as of the date the report is submitted. The Electronic Data Interchange Manual may be obtained at http://www.state.nj.us/dep/srp/hazsite/index.html or by calling (609) 292-9418. Electronic deliverables are not required if the summary table is prepared as part of the remediation of a specific discharge event or for an area of concern that consists of a storage tank storing heating oil for on-site consumption in a one to four family residential building where there has been no groundwater impact.

(1) The following locational information shall be submitted:

(A) Horizontal data points shall be reported in New Jersey state plane coordinates using the North American Datum of 1983 (NAD 1983), in accordance with the Department's Mapping and Digital Data Standards at N.J.A.C 7:1D Appendix A, using units of U.S. survey feet;

(B) Locational information collected in latitude and longitude shall be converted to New Jersey state plane coordinates. Conversion programs can be obtained at http://www.state.nj.us/dep/srp/hazsite/index.html.

(2) All vertical data points should be reported as depth below ground surface, and in mean sea level using the North American Vertical Datum of 1988 (NAVD 1988) in accordance with the Department's mapping and digital data guidance which can be referenced at http://www.state.nj.us/dep/gis/.

(3) All submissions of electronic data which contain locational information should also include a metadata file. For guidance in creating a metadata file, see the version of the Department's mapping and digital data guidance recent to the time of submission. This guidance document is located at http://www.state.nj.us/dep/gis/.

4. Stratigraphic logs, which include soil/rock physical characteristics and field instrument readings detected during drilling for each soil boring, test pit and monitoring well;

5. Stratigraphic cross sections of the site using information from monitoring wells, test pits and borings, if available;

6. All soil boring, piezometer, and monitoring well records, including the State permit numbers and as-built specifications, if applicable;

7. The following information shall be reported for each monitoring well sampled for each ground water sampling event. All measurements shall be to the nearest 0.01 feet:

i. Before purging:

(1) The date, time, and weather conditions;

(2) The well identification number and State well permit number;

(3) The photoionization detector (PID) and/or flame ionization detector (FID) reading taken from the well immediately after the cap is removed;

(4) The thickness of free product, if present, as determined pursuant to N.J.A.C. 7:26E-2.1(a)11;

(5) pH, dissolved oxygen, temperature, and specific conductance;

(6) The total depth of the well from the top of casing or surveyors mark if present;

(7) The depth from the top of the casing to the top of the screen;

(8) The depth from the top of the casing to the water; and

(9) The estimated water volume in the well.

ii. After purging:

(1) The start and end time for purging;

(2) The purge method;

(3) The purge rate(s);

(4) The total volume purged;

(5) The depth from the top of the casing to the water after purging; and

(6) pH, dissolved oxygen, temperature, and specific conductance.

iii. Before sampling:

(1) The depth from the top of the casing to the water before sampling.

iv. After sampling:

(1) The start and end time for sampling;

(2) pH, dissolved oxygen, temperature, and specific conductance; and

(3) The sampling method.

v. Any comments concerning field observations during the ground water sampling event, such as slow recharge, turbidity, odor, sheen, PID and/or FID readings, model number and ionization potential of PID and/or FID used, shall also be reported; and

8. Any other data and information obtained pursuant to N.J.A.C. 7:26E-3.3 through 3.12.

(d) The site investigation report shall also include the following legible maps and diagrams:

1. Site and area of concern base maps pursuant to N.J.A.C. 7:26E-3.2(a)3i;

2. Sample location map(s), including:

i. All sample locations, sample depths and contaminant concentrations shall also be plotted on the map. Where an entire contaminant class is not detected or is less than the applicable remediation standard, contaminants need not be listed individually;

ii. Map scale (including bar scale) and orientation (including north arrow);

iii. Field identification numbers for all samples; and

iv. If more than one map is submitted, maps shall be presented as overlays, keyed to the base map in (d)1 above; sample locations may be superimposed on the site or area of concern map in (d)1 above. Alternatively, individual maps may be submitted which have a common coordinate system and common scale, provided each map details the features of the base map in (d)1, above;

3. If applicable, a map of the distribution of surface water, structure and airborne contaminants, including sample location numbers and contaminant concentrations;

4. Photos may be submitted to document the location of all soil and sediment sample locations; and

5. A ground water elevation contour map and a Contour Map Reporting Form set forth in Appendix G, incorporated herein by reference, for each aquifer for which groundwater flow was determined. Each map shall indicate the direction of groundwater flow relative to site features, and include a north arrow and bar scale.